Algebra 1
Mrs. Moore/Mrs. Hinds

Name: Key
5.3 Notes (Day 2) – Solving Systems by Elimination

There may be a time where you need to multiple both equations by a different number to eliminate a variable.

Example 1: $\begin{matrix}(-5x+2y=32)\,2\\(\ 2x+3y=10\ )\,5\end{matrix}$

$-10x+4y=64$
$16x+15y=50$

$19y=114$

$\frac{19y}{19}=\frac{114}{19}$

$y=6$

$2x+3y=10$
$2x+3(6)=10$
$2x+18=10$
$-18\ \ -18$

$2x=-8$

$\frac{2x}{2}=\frac{-8}{2}$

$x=-4$

$(-4,6)$

Example 2: $\begin{matrix}(2x+5y=26)\,3\\(-3x-4y=-25)\,2\end{matrix}$

$6x+15y=78$
$-6x-8y=-50$

$7y=28$

$\frac{7y}{7}=\frac{28}{7}$

$y=4$

$2x+5y=26$
$2x+5(4)=26$
$2x+20=26$
$-20\ \ -20$

$2x=6$

$\frac{2x}{2}=\frac{6}{2}$

$x=3$

$(3,4)$

There may be a time where you need to rearrange one or both of the equations so they are in standard form $(Ax + By = C)$. You always want the variables to line up so you can use the elimination process.

Example 3: $2x + y = 25$
$3y = 2x - 13$

$-2x \quad -2x$

$-2x + 3y = -13$
$2x + y = 25$

$\frac{4y}{4} = \frac{12}{4}$

$y = 3$

$2x + y = 25$
$2x + 3 = 25$
$\quad -3 \quad -3$

$\frac{2x}{2} = \frac{22}{2}$

$x = 11$

$(3, 11)$

Example 4: $-3x + 4y = -18$
$x = -2y - 4$

$+2y \quad +2y$

$3(x + 2y = -4)$
$-3x + 4y = -18$
$3x + 6y = -12$

$\frac{10y}{10} = \frac{-30}{10}$

$y = -3$

$x = -2y - 4$
$x = -2(-3) - 4$
$x = 6 - 4$
$x = 2$

$(2, -3)$

Example 5: $3(-2x + 3y = -15)$
$2(3x + 2y = -23)$

$-6x + 9y = -45$
$6x + 4y = -46$

$\frac{13y}{13} = \frac{-91}{13}$

$y = -7$

$-2x + 3y = -15$
$-2x + 3(-7) = -15$
$-2x - 21 = -15$
$\quad +21 \quad +21$

$\frac{-2x}{-2} = \frac{6}{-2}$

$x = -3$